

[20]

**SARDAR PATEL UNIVERSITY V.V.NAGAR**B.Sc. (IV<sup>th</sup> SEM.) INSTRUMENTATION (Voc.)17<sup>th</sup> APRIL-2018 EXAMINATION

OSCILLATOR AND OPTICAL DEVICES (US04CINV02)

TIME: 10:00 am to 1:00 pm

MARKS-70

**Q-1 Choose correct answer****[10]**

1. A crystal oscillator works on the principle of \_\_\_\_\_.  
(A) Piezoelectric (C) Mutual induction  
(B) Induced emf (D) None of above
2. In phase shift oscillator feedback RC circuit gives total \_\_\_\_\_ degree of phase shift.  
(A) 75 (C) 180  
(B) 270 (D) 210
3. Pin no. 6 of 555 timer IC is \_\_\_\_\_.  
(A) trigger (C) discharge  
(B) supply (D) threshold
4. \_\_\_\_\_ laser use as cutting application in industries because of its high output power.  
(A) CO<sub>2</sub> (C) Ruby  
(B) He-Ne (D) None of above
5. In homojunction type of structure optical output power is \_\_\_\_\_.  
(A) High (C) Zero  
(B) Low (D) None of above
6. \_\_\_\_\_ is type of optical detector.  
(A) PIN (C) inductor  
(B) PN (D) None of above
7. \_\_\_\_\_ absorption is called off ions in the material.  
(A) UV (C) iron resonance  
(B) IR (D) None of above
8. \_\_\_\_\_ is one of the loss in fiber optic cable.  
(A) Radiation (C) Magnetic  
(B) Electrical (D) None of above
9. The term \_\_\_\_\_ is used to describe pulse broadening effect by fiber.  
(A) Scattering (C) Radiation  
(B) Dispersion (D) None of above
10. In fiber optics light propagate through total internal \_\_\_\_\_.  
(A) Diffraction (C) Reflection  
(B) Scattering (D) Refraction

P.T.O

- Q-2 Short answer type question. (any ten) [20]**
1. State Barkhausen criteria and explain in short.
  2. What is oscillator? Explain briefly.
  3. What is piezoelectric effect? Briefly explain its equivalent circuit.
  4. Write difference between LED and LASER.
  5. Write short note on Ruby Laser.
  6. Only draw and label the edge emitting led.
  7. Define Snell's law with equation.
  8. What is photo detector? Explain in brief.
  9. Briefly Explain: Refraction and Critical Angle
  10. Explain radiation losses in fiber.
  11. Write uses of single mode and multimode fiber.
  12. What is the basic requirement of LED?
- Q.3 Explain Astable multivibrator using 555 timer IC block diagram also draw waveform of output pin and capacitor. [10]**
- OR**
- Q.3 List different types of oscillator and explain any one LC oscillator in detail. [10]**
- Q.4 Explain any one of laser in detail and explain any one application of laser in detail. [10]**
- OR**
- Q.4 List different types of LED and explain Surface emitting led in detail with neat diagram. [10]**
- Q.5 What is photo detector? List different types photo detectors and explain any one detector in detail with neat diagram. [10]**
- OR**
- Q.5 List different types of fiber optics explain construction of fiber optics in detail. [10]**
- Q.6(A) Draw block diagram of fiber optics communication system and explain in detail. [05]**
- Q.6(B) Give full comparison of metal cable with fiber optic cable. [05]**
- OR**
- Q.6 Explain single mode and multimode step-index fiber in detail [10]**

—————X—————